whose arm had been fractured by the bursting of a bomb-shell. This apparatus was composed of thirteen "*nervures*" of palm, each one inch wide, two to three lines in thickness, and nine inches long, convex on one surface, plane on the other, and arranged along and secured to a portion of prepared sheepskin; a space of three or four lines being maintained between them. This apparatus was supported upon the members by means of cords of wool loosely applied, but susceptible of constriction by twisting pieces of wood under them until the necessary force is given: in fact, a species of tourniquet. So arranged, this apparatus is perfectly applicable to simple fractures; but, in the case of the poor woman referred to, it was compound, and required dressing: to accomplish this without removing the apparatus, a portion of two of the splints, with the skin which covered them, was removed. Many modifications of this apparatus appear to be in use among the different tribes, and they are all ingenious. Certainly the contrivance which they employ to give to the apparatus the necessary constriction is worthy of remark; for it does not expose the member to any shock, and completely answers the end.—*Brit. & For. Med. Rev.* October, 1838.

39. *Immovable Apparatus for the treatment of Fractures.*—In the No. of the *British and Foreign Medical Review* for October last, there is an excellent account of the Immovable Apparatus for the treatment of Fractures, and a full and able exposition of its supposed advantages. Although we are not prepared to admit to its full extent, the writer's estimate of the value of this method of treatment, we do not doubt its utility in certain cases, and therefore subjoin copious extracts from his paper. "In 1834, M. Seutin, chief surgeon of the Hospital Saint Pierre at Brussels, finding several inconveniences attendant upon the use of the immovable apparatus for fractures, of Dieffenbach and Larrey, he was induced to seek some means by which the principle of those apparatuses might be carried out in a manner more free from objection; and such means was presented to him in *starch.* By means of this article an apparatus was easily procured, and not costly; it acquires considerable solidity, and a tenacity which enables it to resist perfectly external shocks; and, when its removal becomes necessary, it is easily accomplished without the destruction of any portion of the apparatus. From that time he has treated all cases of fracture, not only in the hospital, but in his private practice, by this method, with the most complete success.

"The mode of application of this apparatus is as follows: immediately after the reduction of the fracture, the limb is surrounded by compresses dipped in Goulard water; a common bandage is carefully applied over these, from the root of the toes to the knee, (supposing the leg to be the seat of fracture:) this bandage is then, by means of a brush, covered over with thick starch; then another bandage is applied, beginning at the knee and descending towards the foot: this is covered like the first, to which it adheres, except on either side of the tendo Achillis, where a little padding is applied. Four pieces of thick paste-board are moistened and moulded upon the leg, before, behind, and on either side of the fractured point: these are secured by two other bandages, one passing from the heel to the knee, the other from the knee to the heel, and covered by starch as before. From two to four days occur before the apparatus is perfectly dry; and from this moment the patient may get upon crutches, a support being given to the affected foot by a stirrup around the neck.

"On the 25th of September, 1837, M. Velpeau presented to the Academy of Sciences a memoir in which is discussed the two prevailing systems of treatment. He maintains that, whatever may be the nature of the fracture, whether accompanied by tumefaction or wounds of the integuments, reduction should be immediately proceeded with: this being accomplished, the part is to be surrounded by compresses, and a bandage moderately firmly applied, extending upwards from the points of the fingers or toes to the superior extremity of the fractured limb: the bandage is then to be brushed over with starch, and so on. The compression, being equal and moderate throughout, sustains the tissues, without occasioning the slightest uneasiness; the patient may turn, move, and act in bed as if there were only simple contusion of the leg. He is no longer condemned to lie on his back for six weeks or two months; he may get up on the third day; he may, without inconvenience, sit on a raised seat, because the leg may be moderately flexed; he may walk with the assistance of crutches, the foot being sustained by a stirrup around the neck. M. Velpeau submitted to the inspection of the section of surgery, patients who walked on the second, third, fourth, and sixth day after the occurrence of the accident. It is admitted by M. Seutin that the principle upon which his system is framed is a simple, but certainly a successful modification of that of Larrey. It has been employed by him in about two hundred cases, with the greatest success; by Velpeau; by a considerable number of surgeons in France and Belgium; and by ourselves, in cases in every respect confirming the statements made in its favour by the persons to whom we have referred.

"We shall now shortly consider the objections which have been raised against the principle upon which the system is founded; and we shall hold that, at the present moment, the method is most perfectly carried out by the apparatus of M. Seutin.

"The principal objections which have been raised against this method of treating fractures are the following: If complete immobility be so necessary to prevent motion at the fractured point, this, it is objected, is often not attained, because from thirty to sixty hours are required for the complete desiccation of the apparatus, during which time motion may be permitted; and because, if, at the moment of application, the tumefaction be considerable, when that subsides, a large space will be left between the bandage and the limb; and there will be, therefore, no resistance to displacement. The answer which may be given to this objection is, that, when a fracture is reduced, it is not usually in the first two or three days that displacement happens; it is after this period, and when motion, involuntary or indispensable, is daily repeated, and the ordinary bandages have become loosened, that this occurs. Now, although humid, the starch apparatus maintains coaptation during the first three days, with at least as much firmness as the ordinary apparatus; that time passed, the danger of displacement is over; the pieces entering into its composition form a compact, coherent mass, exactly moulded upon the limb, adapting itself to all the inequalities of surface, and forming with it a perfect whole. A displacement, according to the axis or to the circumference of the limb, is completely prevented, because the superior fragment is included in the same mould as the inferior, and both must together be carried in any direction which is given to the limb; for no separate portion or fragment can possess the power of moving without the motion of the whole.

"If we move a lower extremity thus maintained, what happens? If an impulsion is given to the foot, the movement is transmitted to the leg, to the thigh, to the pelvis: no partial movement can occur, but the whole movement must be borne in the direction of the impulsion, and no displacement of the fragments can have place, because all are moved in the same direction at the same moment.

"Already many substitutes for starch have been proposed, with the view of removing the inconveniences with which the apparatus is charged. A composition of starch and alum, glue, pitch, and other substances, have been named. M. Lafargue has just detailed a case in which he employed a mixture of starch with gypsum in fine powder, in which the apparatus was perfectly firm in six hours. M. Velpeau at present employs, with the same view, dextrine.

"With respect to the second point, as to the space which may be left between the bandage and the limb, it usually happens that it is not considerable; it is not produced until after many days; the work of consolidation is then somewhat advanced; the ends are included in a callus which affords a powerful support.

"Supposing the apparatus to be placed on a limb which is much tumefied, and that tumefaction rapidly subsides, so that at the end of a few days a considerable interval is found to exist between the limb and the bandage, the inconvenience may be remedied by firmly applying another bandage. The solidity of the apparatus might be thought an obstacle to the action of the bandage, but experience has shown that the difficulty is not insurmountable.

"Another objection which has been raised is, that the early application of a bandage, before the development of a coming tumefaction, may produce a strangulating effect. Experience has shown that the fears of gangrene, as a consequence of this pressure, are unfounded. When an ordinary bandage is too tightly drawn at the level of the fractured bone, whilst the lower or more distant portion of the limb is less firmly compressed, tumefaction follows, which, if the constriction be continued, will end in gangrene; but a pressure of an uniform character, extended from the toes or fingers, uninterruptedly, along the member, is opposed to the tumefaction of the parts and to gangrene: in fact, by such pressure, we may procure atrophy of the limb, but not gangrene. Therefore is it important that the compression should be exact and uniform; and, in a large majority of cases, its effects, so far from being injurious, will be found to be decidedly salutary.

"In fact, there are two kinds of compression: the one which is opposed to the reflux of venous blood, (that, for instance, which we establish circularly around the arm when we wish to bleed a patient;) the other, which is opposed to the ingress of arterial blood and favours the egress of venous blood, is that of every agent which compresses a limb equally at all points, and commences by a methodical compression of the portion farthest removed from the trunk. The first determines gangrene when long continued; the second is decidedly opposed to inflammation: the first is as strongly repulsed by the advocates for permanent bandaging as by others; and the second must belong to that method properly employed. Still we would say that, where the tumefaction of the limb is very great, the application of the apparatus should be delayed for some days; not because pressure would exercise any baneful influence, but because, when the tumefaction is dissipated, too great an interval may be left between the limb and the bandage, and because some difficulty might be experienced in determining upon the exactitude of the coaptation.

"Another disadvantage which has been attributed to this method is, that the practitioner is left in the dark as to the state of the limb; that, when once applied, it must there remain up to the moment of consolidation of the fracture; and that, before this period, we cannot ascertain whether there be eschars, abscess, or other similar complications. If only moderate attention be used, none of these accidents need occur: they must produce pain and general symptoms; and nothing can be easier than to remove the bandage. As far as strangulation is concerned, too, the extremities of the fingers or toes, which are uncovered, will always give timely indication of the approach of gangrene.

"Again, it has been said that the bandage may produce excoriation and eschars, in consequence of the unyielding nature of its materials, against which the integuments may rub and become ulcerated. When we consider that the soft parts within the bandage remain perfectly immobile, and that the compression is exercised equally at every point, the apparatus being exactly moulded on eminences and depressions, we shall conclude that the occurrence of such accidents must be extremely unfrequent. Besides, the first layer of starch is on the outside of the bandage, and not in contact with the skin, and, even were it otherwise, the inconvenience might easily be avoided by interposing between the bandage and the limb any substance which, without preventing the necessary compression of the parts, would obviate such an inconvenience.

"Such are the objections which have been urged against the treatment of simple fractures by this method: against the system, as applied to the treatment of fracture with wound of the integument, a more formidable objection has been made. It has been stated that pus is confined, and that the consequences are extremely injurious. The most conclusive answer which can be made to this objection is, that many hundreds of cases have been treated by this method, and that such consequences rarely occur. When the tumefaction is dissipated, and the period of suppuration has set in, the pus is poured out, penetrates the compresses, and gradually the different parts of the apparatus become impregnated with it. Some time is occupied in the production of this effect, and a multitude of facts clearly demonstrate that, beyond this point, suppuration very rarely proceeds. At first the purulent matter occupies the space left vacant by the subsidence of the tumefaction, but its force of expansion proceeds no farther; the compressive power of the apparatus restrains it; there is no reflux, and infiltration of the integuments hardly ever takes place. It is, therefore, a new obstacle to the farther pouring out of purulent matter, which soon undergoes many changes; certain fluid portions are absorbed; and, being preserved from contact with atmospheric air, it does not contract those deleterious qualities which, under the influence of this agent, it usually acquires: the other portion extravasated between the integuments and the apparatus, and which pervades the latter, evaporates, leaving a concrete portion, which forms a stratum around the limb, which singularly adds to the solidity of the apparatus.

"Before we proceed further, we will refer to the apparatus of the Arabs; and, certainly, we cannot say less in its favour than that it is a true "immovable" apparatus, of easy application, more simple and effectual than that of Dieffenbach; little less so than that of Seutin.

"Those persons who have no fears with regard to the necessity of providing for the escape of pus, may urge the bad consequences of leaving the wound exposed, and of the less rapid cicatrization; and no doubt the introduction of that principle would be a most important improvement upon the Arab system. Certain it is their apparatus perfectly accomplishes the common indications in treatment; the fragments are maintained motionless, the member is submitted to a uniform compression, variable at will, without shock or disturbance: and, with respect to their arrangement when the fracture is compound, it must be admitted that, when the opportunity of examination is unfrequent, the course they take is the safest.

"We will now contrast, very shortly, the two systems of treating fracture of the lower extremity.

"The method commonly employed in this country requires a confinement to bed, in the same position, for a period varying between three weeks and as many months. If the patient be in robust health at the commencement of this treatment, it is damaged at the end; if he be debilitated, that debility is aggravated; if he be occupied in trade or any occupation requiring his personal attendance, it must suffer in his absence; if he be a traveller, where he falls there he commonly lies, whatever may be the inconvenience: if the fracture be compound, all these evils are aggravated; the patient may be pulled down by profuse suppuration, or his wound may be exposed to all the accidents to which such a surface is liable. There are also other considerations of much importance which belong to the subject: frequent watching is necessary, and this among the poor in rural districts is frequently impracticable. For instance, a man may be surgeon to a large union of parishes under the present administration of the poor-laws: three or four fractures may happen at different points of that union: it is impossible for him to give them all the necessary attention; and, though the fractured bone may unite, it is often at an angle. Under the other system, the necessary apparatus may be found in a cottage; it is of easy application; it is not irksome to the patient; tumefaction, when present, is more speedily dissipated; and, if it be not already developed, is almost constantly restrained; the patient may, under ordinary circumstances, be left with a conviction that all will go on well; and, when the union is accomplished, instead of being reduced, by confinement, to a debilitated condition, the patient is enabled, on the fourth or sixth day, to leave his bed; the tradesman to attend to his ordinary business; the traveller to proceed on his journey without risk; and, if the fracture be compound, the tendency to suppuration is restrained, and the injury rapidly reduced to one of a simple nature."

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40. *Treatment of Hydrocele by injections with Iodine.*—In our No. for Nov. 1837, p. 258, we noticed the success of Mr. J. R. MARTIN in the treatment of Hydrocele by injections of a solution of tincture of Iodine. Mr. M. has since communicated to the Medical and Physical Society of Calcutta a report of his subsequent experience—from which it appears, that since the 2d, January, 1835, (the date of his former report) 601 cases of hydrocele have been treated at the Native Hospital, making in all 777 cases since March, 1832. Of those 766 had